What's Become of Derivations? Defaults and Invocations*

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The enormous success of transformational syntax hinged on the powerful - as it turned out, only too powerful - logic provided by its scheme of derivations (sequences of syntactic representations leading from 'underlying' or 'deep' structures to 'surface' structures), with an attendant scheme of sequential rule application and stipulated 'rule ordering'. The challenge to monostratal syntactic frameworks is to get the effect of transformations entirely via static conditions on syntactic representations, a program that entails devising alternative logics capable of expressing the attested types of interactions between conditions on syntactic form.

These interactions are of three types, the unproblematic one of mutual applicability and two others that are the focus of this paper: preclusion, for which the crucial concept is defaulting, and superimposition, for which the crucial concept is invocation. Preclusion corresponds roughly to 'bleeding' interaction, superimposition to 'feeding' interaction, but I will avoid these terms from phonology because they are embedded in an ineradicably derivational framework.[1]

1. Morphological background. I will illustrate the analytic points first from morphology rather than syntax.

I assume that conditions on representations (whether morphological or syntactic) are imposed by rules, each rule being an association between a set of formal conditions and a semantic function (and possibly also pragmatic values); in syntax, then, rule is an effective synonym of construction, as this latter term is used in Zwicky (1987, 1988, 1989a) and Fillmore et al. (1988). There are also 'listed' form-meaning pairings (idiosyncratic lexemes in the case of morphology, as well as idiosyncratic syntactic patterns, also known as idioms), rules differing from listed items in that both the formal conditions and the semantic functions in rules are general.

1.1. Defaults. Defaults play a role in morphology whenever there is competition between conditions, either by virtue of their associated meanings (in word formation) or by virtue of their associated phonological shapes (in inflection) or by the two types of competition in concert (in both word formation and inflection).

1.1.1. Dual competition. English derivational morphology has a number of rules licensing abstract Ns built on Adj stems: GOODNESS with suffix *-ness*, SANITY with suffix *-ity*, CONSTANCY with suffix *-(c)y*, for instance. The default (general, predominant, and productive) rule is the one with *-ness*, which is overridden by various other rules for certain lexemes. English inflectional morphology has at least two rules realizing the grammatical category (hereafter, gramcat) PSP (past participle) for Vs, one setting the form identical to the PST (past), as in *jumped* and *thought*, the other using the suffix /n/, as in *taken* and *thrown*. The default (general, predominant, and productive) rule is the former one, which is overridden by the latter for certain lexemes. In these examples it happens that the formal conditions in the rules are incompatible, so that there is dual competition, in phonology as well as as meaning. It is impossible to suffix both *-ness* and *-ity* directly to a stem, for instance.

In inflectional morphology it is not uncommon for one rule to realize a superset (say, 2 SG INDIC or 1 PL INDIC, to choose an example from Hua (Haiman 1980)) of the gramcats realized by another rule (say, INDIC in general, covering the other two SG forms, the other two PL forms, and all three DU forms). When the phonological effects of the two rules are incompatible (as in Hua, where these are suffixes *-ne* and *-e*, respectively, filling the same slot),

then of course the more specific rule takes precedence, via the general metaprinciple I will refer to as Panini's Principle.

There is also a general metaprinciple of 'lexical blocking', according to which the existence of a stipulated association of meaning and form for a particular lexeme (as in the PST *went* for GO) precludes associations provided via rules.

1.1.2. Meaning competition alone. Phonologically compatible rules - word formation rules - can be in competition, however, as when prefixal and suffixal causatives are available in the same language (ENLARGE and CHRISTIANIZE, for instance), or when 'zero derivation' and affixation serve as alternatives (CAGE and ENCAGE, or BONE and DEBONE, for instance).

1.1.3. Phonological competition alone. There are also situations where rules - inflectional rules - that are perfectly compatible semantically are incompatible phonologically. I have in mind here the 'slot competition' examples that Stephen Anderson has unearthed. As Anderson (1986: 8) says of Georgian, 'the formal markers v- [marking first-person subject] and g- [marking second-person object] are mutually exclusive by virtue of their "competition" for the same formal position'; the v- prefix is the winner here.

1.1.4. Parochiality. Note that some of these override-default relationships involve specific rules, but that others - in particular, lexical blocking and Panini's Principle - involve general principles. It is not always clear whether a particular example is of one type or the other. If subregularities in conjugation are analyzed via features, for instance, so that a lexeme like TAKE or THROW is [CONJ 2] while regular Vs lack this feature, then the precedence of the subregular form over the regular one follows from Panini's Principle, though one might instead want to say that the relationship is to be stated directly as one holding between the two rules. It might also turn out that some general principle would predict the winning rule in the Georgian competition (perhaps by reference to the gramcats involved), though I am not sanguine about the possibility.

What is important here is not in fact whether particular relationships follow from a general principle or require parochial stipulation, but that the relationships hold between rules, not representations.

1.2. Invocation. The leading idea here is that satisfying the conditions placed by one rule requires checking the conditions in a number of other rules.

1.2.1. Invocation by mention. The fundamental way in which invocation plays a role in morphology is, like Panini's Principle, so obvious that it is easy to overlook: Mentioning conditions on the 'inputs' to a rule calls up all the rules and lists that make those conditions satisfiable.

A derivational rule applying to ADJ inputs (for instance, the nominalization rule for OAFISHNESS, SWEATINESS, SPEECHLESSNESS, and HAPPINESS) calls up, or invokes, all the conditions relevant for ADJ lexemes (including both the rules for OAFISH, SWEATY, and SPEECHLESS and the listing of items like HAPPY). To pursue the goal of determining whether an abstract N like OAFISHNESS is licensed by the derivational rules of English, we must determine, as a subgoal, that OAFISH is licensed as an ADJ.

1.2.2. Calls on rule sets. In addition to input conditions, morphological rules place conditions on the phonology of input-output associations. A rule might stipulate that the phonology of the output is the phonology of the input plus a stipulated suffix, for instance. These association conditions can involve reference to sets of morphological rules, as well as to operations on phonological shapes; see Zwicky 1989b for further discussion and references. Here I cite three types of examples.

1.2.2.1. Word formation calling on inflection. There can be word formation rules that call for specific inflected forms of an input lexeme, as when a French rule deriving manner ADVs in *-ment* (like FAUSSEMENT 'falsely') builds on the FEM form of an ADJ (like *fausse*, the FEM form of FAUX 'false'), whatever that happens to be.

1.2.2.2. Rules of referral. There can be inflectional rules that explicitly refer the realization of some set of features to the realization for another, as when the default rule for the English PSP stipulates that the PSP for a lexeme has the same realization as the PST for that lexeme, whatever the latter happens to be.

1.2.2.3. Calls on stems. Both inflectional and word formation rules can refer to specific stems, as in McCarthy's (1981) treatment of the 'patterns' or 'binyanim' in the derivational morphology of Arabic, each pattern involving a combination of a CV melody with a vocalism and a root consonantism. When a derivational rule stipulates that it uses a particular pattern, the rule or rules describing the conditions on phonological shape for that pattern will be invoked.

2. Some observations. Before extending this discussion from morphology into syntax, I pause to make four metatheoretical observations.

2.1. Theorizing. My intention in section 1 was not to advance a new theory of morphology, nor will I be advancing a new theory of syntax in sections 3 and 5. My discussion is at a different level of abstraction from theorizing proper, since it aims at delineating the properties of expressions, the characteristics of rules, and the relations between rules that an adequate theory must be able to express in its formalism. I take no stand here on the nature of such a formalism.

2.2. Directionality. The temporal metaphors I have used for defaults and invocations run the opposite way from the ones that are converted to theoretical status in processual derivations. An override 'takes precedence' over a default, but a (more) basic representation (the analogue of the default) 'comes before' the derived representation it is mapped into. An invoking rule 'calls up' an invoked condition and so can be said to 'come first', but in processual derivations the latter describes a representation that 'precedes' the one to which the former applies; crudely, invocations work top-down, while processual derivations work bottom-up.

The temporal metaphors for defaults and invocations are dispensible, however. This is straightforward for defaults, but might not be so clear for invocations, especially given my own inclination to think of rules as applying as in top-down parsing - as checking, for instance, that an expression satisfies the conditions of a particular derivational rule of English by determining that the expression is an abstract N and that it can be analyzed as X plus *-ness*, then checking that X is an ADJ (perhaps by virtue of satisfying the conditions on a derivational rule with ADJ outputs). But this way of thinking of things is a personal bias, and others undoubtedly will find it more intuitive to think of expressions as being built up from elementary expressions, with the conditions invoked in some rule checked 'first' to see if X is an eligible subpart for the purposes of that rule. As with ordinary phrase structure rules, neither way of thinking is somehow right. Rules can be conceptualized statically, as just stipulating a set of conditions that have to be satisfied within the expressions of a language.

2.3. Descriptive power. It might seem that successive invocations of rules and successive overrides of defaults are just derivations run backwards, and (from the metatheoretical point of view) no real improvement over transformations. However, as I pointed out in Zwicky (1986b), a framework built on defaults is less powerful than one built on derivations, in the sense that a default/override analysis can always be translated into a basic/derived analysis while the reverse translation is not always possible without gross loss of generalization.

Indeed, since a derivational framework describes relations between (sets of) representations, it makes available any number of strata of representations at which conditions might be stated. In a purely static framework, where invocations and overrides are relations between rules, there is only one stratum of representations at which conditions can be stated. This is the source of the greater descriptive power of derivational frameworks. If we can do without this power in morphology (and syntax), that is all to the good. The issue is certainly a controversial one - the relational grammarians, in particular, have maintained that there are syntactic generalizations referring to several such strata (Perlmutter 1982) - but I will pursue a nonderivational framework, following the monostratal program of generalized phrase structure grammar (GPSG) (Gazdar et al. 1985).

Note that I have argued, in Zwicky (1986b), that phonological rule interactions, whether these involve two rules of automatic phonology or two morphonological rules, do indeed require the more powerful logic made available by derivations, while it appears that rule interactions in morphology and syntax do not. Monostratality seems to be characteristic of morphosyntax but not of phonology.

2.4. Representations. What should a (morphological or syntactic) representation for some expression contain? Certainly, the information about this expression's properties that is immediately relevant for determining whether (morphological or syntactic) rules are applicable, plus the information that is needed for the purposes of semantic interpretation, of assigning pragmatic values, and of phonology.

If morphological and syntactic rules are viewed, as they are here, as associations of formal conditions with a semantic interpretation function and pragmatic values, then the question boils down to a matter of the information immediately relevant for the applicability of these rules, plus the information relevant to phonology, both for the applicability of morphonological rules and for 'prosodic domain formation', which associates the (prosodic) domains of automatic phonology with morphosyntactic representations. I suggest in Zwicky (1989c) that considerable insight into morphosyntactic representations might be gotten by considering the needs of phonology. Be that as it may, it is none too clear just which properties of expressions are in fact immediately relevant for the applicability of morphological or syntactic rules.

Presumably, when an expression satisfies some overriding rule, like the /n/ PSP rule, then information about the corresponding default(s), here the referral of PSP to PST, is never relevant. What counts is what actually appears, not what might have appeared instead.

Matters are a bit more complex for invocations. The conditions placed by a rule on expressions can be seen as coming in layers. For instance, an inflectional rule realizing PSP on Vs requires (as a necessary condition) that an expression belong to the category V and (as a sufficient condition) that it belong to the gramcat PSP; these are primary, or layer-1, conditions. A referral of PSP to PST is in layer 2, and a realization of PST via suffixation of /d/ in layer 3.[2] Now consider the word formation rule illustrated in the compounds *worm-eaten*, *termite-infested*, and *doctor-approved*. It requires (as a necessary condition) that an expression belong to the category ADJ and (as a sufficient condition) that it be composed of two expressions, one of category N and one of category V; these are layer-1 conditions. The requirement that the V belong to the gramcat PSP is in layer 2, a referral of PSP to PST in layer 3, and /d/-suffixation (as in *approved*) in layer 4.

But, given an expression E, just how many layers of conditions that E satisfies are relevant to E's own ability to participate in constructions? I do not believe this question has a simple answer, either 'the first n layers' for some fixed n, or for that matter 'all of them'. I do reject the idea that we should assemble into a single representation all the information about which conditions on which rules E satisfies, no matter what the layer of these conditions - an idea embodied to some extent in the 'analysis trees' of Montague grammar

(Dowty et al. 1981: ch. 7), though these are not intended as syntactic representations, and embodied fully in the relational networks of relational grammar and in the R-graphs of arc-pair grammar (Johnson & Postal 1980, Postal 1982), which are so intended. That is, a representation of E is an assemblage of information relevant for the application of grammatical rules to E, not a full trace of the procedures involved in determining E's wellformedness according to those rules.

3. Defaults in syntax. Defaults have played an explicit role in the various 'unification-based' frameworks (Shieber 1986) for syntax, including GPSG and lexical-functional grammar (LFG) (Bresnan & Kaplan 1982). The true role for defaults is rather larger than syntacticians have thought. To begin with, many of the basic/derived relationships between representations in transformational syntax (relationships expressed as a single transformation) translate into override/default relationships between two rules in a monostratal framework (Zwicky (to appear)).

As in morphology, in syntax override/default relationships arise generally whenever there is competition between rules expressing compatible meanings via incompatible formal characteristics - having to do with branching into constituents, with the placement of properties on words within a construct (including government of or agreement in gramcats), or with the ordering of the immediate constituents.

3.1. Dual competition. There are situations where distinct, and formally incompatible, rules express the very same meanings, so that there is competition in meaning as well as form.

For instance, the hierarchical (binary) subject-predicate (SVP) construction in English, as in *I sing badly* and *For me to sing badly* (*would be no surprise*), serves as the default vis-à-vis the flat (ternary) subject-auxiliary inversion (SAI) construction, as in *Must I sing?*. The two constructions have the same semantics, involving the application of a function (associated with the VP) to an argument (associated with the subject (SU)). And they are certainly formally incompatible; the SU cannot both precede (as in SVP) and follow (as in SAI) the head V of the clause. That SAI is the special, overriding, construction is indicated by its use in a small but diverse collection of constructions: two interrogative constructions, the yes-no question (YNQ), as in *Must I sing?*, and the information question (WHQ), as in *Which songs must I sing?*; focused negation (FOCNEG), as in *Not a song did I sing*; and two conjunctionless conditional constructions, one counterfactual, as in *Were I in better voice,* (*I would sing*) and *Had I known your wishes,* (*I would have sung*), and one not, as in *Should you want to sing,* (*we can supply an accompanist*).

3.2. Panini's Principle again. A somewhat different sort of situation arises in the matching of morphological cases[5] to grammatical relations (grels). There are default matchings (NOM to SUs, ACC to DOs, DAT to IOs), which are overridden in many languages by the assignment of 'quirky' cases; in Icelandic (Andrews 1982), for instance, these are ACC, DAT, or GEN for a SU and DAT, GEN, or NOM for a DO.

I assume that for each configuration of quirky case assignment there is a special rule - so that Icelandic has, in addition to a (general) rule, call it #28, stipulating that head Vs are compatible with SUs (not otherwise constrained) and DOs (not otherwise constrained), a (special) rule, call it #97, stipulating that head Vs are compatible with DAT SUs and NOM DOs, another (special) rule, call it #35, stipulating that head Vs are compatible with SUs (not otherwise constrained) and DAT DOs, and so on. Every rule R mentioning a lexical category C induces a subcategorization of C, the relevant subcategory C_R comprising all the members of C eligible to occur in the mentioned slot in R; thus, for Icelandic there is a subcategory V_{28} of garden-variety transitive verbs, a subcategory V_{97} of DAT-SU transitives, a subcategory V_{35} of DAT-DO transitives, and so on. In any event, rules #97 and #35 are semantically in competition with #28 (the semantics for #97 and #35 includes, though not necessarily properly,

the semantics for #28), and they are formally more specific than it, both in their argument cases and in their head subcategories, so that Panini's Principle says that they override it.

This treatment presupposes the splitting of 'standard' (nonquirky) case assignment into two parts: rules like #28 in Icelandic, which describe compatibility between a head and constructs bearing specific grels to this head, but mention no case properties of these constructs; and other principles, analogous to the Feature Specification Defaults of GPSG, which describe default implicational relationships between properties of constructs, in this instance between a grel (like SU) and a case (like NOM). Principles of the second sort can be seen as compatibility rules of a degenerate sort, which merely license certain properties as admissible on a construct X bearing a particular grel, without regard for what other constructs X might be compatible with.

Just as there is quirky case, there is quirky agreement, as in the varieties of Somali where a rule permitting verbs to be FEM SG with PL SUs from a particular declension class overrides the default scheme of agreement via compatibility in gramcats (Zwicky & Pullum 1983). In quirky agreement, certain agreement triggers require specific nonagreeing properties on their targets. Panini's Principle says that such rules should override rules calling for gramcat compatibility between agreement triggers in general and their targets.[4]

3.3. Formal competition alone. As in morphology (section 1.1.3 above), two syntactic rules can compete solely by virtue of their formal conditions.

Consider, for example, the English WHQ and FOCNEG constructions, both of which involve a 'focus initial' (FOCINIT) construction, which focuses on a proform (an indefinite WH lexeme like WHICH or WHEN, a negative lexeme like NOT or NEVER, respectively) by requiring clause-initial position for a construct containing the proform, as in *Which cookies have you eaten?* and *Not a single cookie have I eaten*, respectively. Note that both WHQ and FOCNEG involve SAI in addition to FOCINIT. For the most part, there is no problem in saying that an expression must satisfy both the conditions of SAI and those of FOCINIT, but as is well known, a conflict arises when the focused proform occurs within the SU of a clause: FOCINIT then requires that the SU be clause-initial, but SAI requires that an auxiliary V precede the SU (perhaps via a default condition requiring that a V precede any of its arguments within their construct, as in the VPs of *You have eaten those cookies* and *I have eaten not a single cookie*). FOCINIT wins this competition, and SAI is blocked for focused SUs: *How many people ate cookies?* and *Not a single person ate a cookie*, but **Did who eat the cookies?* and **Did not a single person eat a cookie.*

As in the morphological example from Georgian, there might be some general principle predicting the interaction of rules - here, predicting that FOCINIT overrides SAI when they are in conflict - but I have at the moment no idea of what that principle might be. The point at issue, of course, is the nature of the interaction, not whether the interaction is stipulated parochially or necessitated by universal principles.

3.4. Optionality and obligatoriness. In the framework I have been developing in this paper there is no natural way to distinguish optionality from obligatoriness, either for rules as wholes or for individual formal conditions imposed by rules. I suppose we could label a rule as obligatory if it happened to be the only option the grammar provided for expressing some meaning. But in general, every rule is an option provided by the grammar for associating form and meaning, and a pairing of an expression with a meaning is licensed by the grammar if every detail of this pairing is licensed by some rule.

It then does not make sense to say that the English rule allowing finite clauses to serve as SU or DO (but not prepositional object (PO)) - *That pigs can't fly distresses me* and *I know that pigs can't fly*, but **I'm aware of that pigs can't fly* - is somehow optional in a way that other rules are not. English simply has a number of rules licensing various types of constituents

serving as particular grels, the default rule being the one allowing NPs to serve (at least) as SU, DO, IO, and PO. It also does not make sense to say that English has a rule describing non-SU finite complement clauses as composed of S[+FIN] optionally preceded by the complementizer lexeme THAT, as in *I know (that) pigs can't fly* versus **Pigs can't fly distresses me*. If there are different formal features, there are different rules - in this example, one rule licensing S[+FIN] as DO, and one or more licensing THAT+S[+FIN] as SU or DO.

We might think of ultimate defaults - properties licensed by rules that override no others - as somehow 'obligatory', but of course they are not obligatory in the sense that the conditions they impose must be satisfied. NP is the ultimate default category for SUs, but that does not mean that all SUs must be NPs, for there are rules licensing S[+FIN], several other types of clause (*For pigs to fly would be ridiculous, What you said impressed me*), and PP (*Under the rug is a bad place to hide a gun*) as SUs. In English ACC is the ultimate default case for NPs, but that does not mean that all NPs must be ACC, for there are rules licensing at least three other cases (NOM in *I must go*, GEN in *My shoulder hurts*, another sort of genitive in *A friend of mine arrived*).

3.5. Layers of defaults. Implicit in the discussion above is the possibility that syntactic defaults can come in layers, a possibility that is amply realized, for example in the distribution of cases in many languages.

Icelandic, for example, has the (usual) ultimate default case for NPs, NOM. The rule assigning NOM to NPs is overridden by rules associating cases with grels, ACC to DO, for instance. The default DO case rule is in turn overridden by rules for the quirky cases, as sketched above. In Finnish (Nevis 1981), the default DO case rule, imposing ACC, is overridden by quirky case rules imposing GEN in some circumstances and NOM in others, and these are in turn overridden by a rule imposing PART[itive] case on 'partial' DOs, those denoting indefinite quantities, as in the PART example *Syön puuroa* 'I eat porridge' versus the quirky GEN example *Syön puuron* 'I will eat (the) porridge'.

4. Default associations within and beyond the grammar. At this point I must comment briefly about how syntax fits with morphology, with semantics, and with pragmatics.

4.1. Syntax with morphology. There are default associations between syntax and morphology; the default constituency for morphological purposes is the one provided by syntax, which will then be overridden by conditions on morphological structure, à la Sadock (1985). In particular, the 'words' of morphology will be coextensive with the 'words' of syntax except insofar as they are stipulated otherwise, as indeed they are for bound word clitics and some other phenomena.

4.2. Syntax with semantics. There are default associations between syntax and semantics, a fact that will play a considerable role in the treatment below of invocations in syntax.

4.2.1. (Sub)categories. As Schachter (1985) has argued in some detail, there are (universal) default meanings associated with categories like N and V and with subcategories like MASS within N and AUX within V; it is these default meanings that allow us to identify (sub)categories across languages. These defaults can be overridden by the meanings of particular lexemes, as when dummy N lexemes like weather IT and expletive THERE in English flagrantly lack the referential semantics associated with the category N.

4.2.2. Gramcats. There are also (universal) default meanings associated with gramcats like PRS, PL, and DAT; it is these default meanings that allow us to identify gramcats across languages - PRS as the gramcat associated with speech time, PL with numerosity, DAT with the Recipient role via the mediation of the associations both of them have with the IO grel, and so on. To say that gramcats can serve as marks of syntactic constructions is to observe

that these default meanings can be overridden by the semantics associated with particular syntactic constructions, and by the listing of meanings for specific forms. For example, a quirky government rule assigning DAT case to DOs overrides not only the syntactic rule assigning ACC case to DOs but also the default association of the Recipient role with DAT. Similarly, a construction could impose a PRS V form, a PSP V form, a PL N form, or a COMP[arative] ADJ form without necessarily imposing the semantics associated with PRS, PSP, PL, or COMP.

4.2.3. Triggers and targets. There are (again, universal) default associations, à la Keenan (1974), between semantic functor-argument relations and the constituent pairs participating in syntactic agreement (and government). The default is for a construct representing the semantic functor to serve as the syntactic target for agreement with a trigger construct representing its semantic argument (V heads agreeing with their SU and DO arguments, ADJs with their heads, and so on). And the default is for the construct representing the semantic functor to serve as the syntactic trigger for government of a target construct representing its semantic argument (V heads governing case on their SU and DO arguments, numerals on their heads, and so on).

For agreement, there is also a default association between compatibility in gramcats and compatibility in semantic properties, so that we expect a V agreement target to share not only the gramcats of its SU trigger, but also the semantic properties of this trigger. These semantic properties - for instance, numerosity of the SU referent, in the case of a V with a collective SU like COMMITTEE - are then available to condition gramcats on the target. In consequence, there is a potential conflict between the gramcats imposed by agreement on the target and those conditioned by the semantic properties of the target, a conflict which can be parochially resolved in favor of either conditioning factor: American English *The committee has decided* (with agreement winning) versus British English *The committee have decided* (with target properties winning).

4.2.4. Anaphors and antecedents. There are also default associations, à la Lapointe (1980, 1983), between anaphor-antecedent pairings and the sharing of gramcats, so that we expect an anaphor to share not only the semantic properties of its antecedent, but also its gramcats and even its purely morphological properties. As in the case of trigger-target associations, there is a potential conflict between the gramcats imposed by anaphor-antecedent sharing and those conditioned by the semantic properties of the anaphor - for instance, between anaphora to a German NEUT[er] N like MÄDCHEN 'girl' via the gramcat-appropriate (NEUT) pronoun ES 'it' or the semantics-appropriate (FEM) pronoun SIE 'she'.

4.3. Syntax with pragmatics. There are also associations - which presumably act as defaults and can be overridden - between rules of grammar (in particular, of syntax and morphology) and a mélange of conventional principles for language use that are often referred to under the heading of pragmatics. I prefer to talk of these principles (following a suggestion of Christopher Culy's) as together constituting a user's manual that accompanies the grammar of a language. The user's manual comes in several volumes, at least two of which concern what I called 'pragmatic values' above, which (like semantic functions) can be default-associated with particular morphological and syntactic rules: (a) a volume dealing with what is conveyed, stylistically and sociolinguistically, by the options made available by the grammar, and (b) a volume dealing with the discourse functions of the options made available by the grammar and saying how the expressions made available by the grammar can be combined into discourses and deployed effectively within them.

5. Invocations in syntax. As in morphology, one syntactic rule invokes, or calls up, others by mentioning conditions that are satisfied via those other rules.

5.1. Mentioning immediate properties. Just as word formation rules in morphology invoke the rules and lists that license their inputs, so syntactic rules invoke the rules and lists

that license the constituent types and grels that figure in them. The English SVP rule, for instance, says that the combination of a SU expression and a VP expression constitutes an S. By mentioning these immediate properties, SVP invokes all the rules that license constituents (NPs, certain PPs, and certain types of clauses) as SUs and all the rules that describe VPs.

5.2. Mentioning contained properties. Unlike morphological rules, syntactic rules place a variety of conditions on proper parts of their immediately contributory expressions. For instance, English has a rule that licenses head Vs (from a subcategory with members INSIST, REQUIRE,...) with clausal DOs whose head V is in the BSE form (*I insist they be admitted*); the condition on the head V is the one at issue here.

In a pure phrase-structure framework like GPSG, all conditions on wellformedness must be locally determined; branching rules are all there is. In consequence, contained properties must be distributed by a scheme of projection from conditions on individual branchings, in the same way that the ordering of individual words and the containment of a word in a construct of some category (say, NP) are determined by projection from the ordering of sister constituents and the relation of immediate constituency. The requirement of local determination gives rise to schemes of feature distribution - the Head Feature Convention, Foot Feature Principle, and Control Agreement Principle of GPSG, and their correspondents in related frameworks such as HPSG (Pollard & Sag 1987) - whose function is to manage the appropriate projections.

My approach here, as in Zwicky (1989c), is to step back from a discussion of formalisms that might allow the program of local determination to be achieved and to inventory instead the sorts of conditions syntactic rules can impose, without regard to the mechanisms any particular theory should provide to impose them.

5.2.1. Properties of individual words or phrases. A syntactic rule can require a certain property on the head word of a construct (BSE on the head V of S, in the example above); on an edge (first or last) word or phrase of a construct (GEN on the last word of an NP in English, as in *my friend from Chicago's hat*); on some word of a construct (WH on one or more words in the initial phrase in the English WHQ construction, as in *Which people from which departments did you meet?*); on some phrase of a construction (NULL on one or more XPs in a WHQ with initial XP, as in *Which candidates did you reject* NP[NULL] *without interviewing* NP[NULL]*?*).

Further refinements are possible. A rule might require that exactly one (rather than at least one) unit have a stipulated property, and rules can differ as to just where within a construct they allow a stipulated contained unit to be located, as when the XP[NULL] in WHQ can be any number of clauses down (*Which candidates did you say Jan insisted we reject* NP[NULL] *?*), while the WH word has to be in the top level of the initial XP (*People from which departments did you meet?* but *People who teach in which departments did you meet?*). I view it as a pressing task for theoretical syntax to determine just what the full inventory of possible conditions on contained properties is. Here I merely suggest the character of the task, my immediate aim being to observe that, for instance, when a rule requires as one of its contributory expressions an S with an XP[NULL] in it, not only are rules licensing Ss invoked, but so are all the rules that license XPs within Ss.

5.2.2. Property matching between expressions. Much the same is to be said for rules involving conditions that require particular pairs of expressions to match with respect to certain properties. The agreement that holds in English between SU NPs and their Vs, for instance, involving a matching between the person and number gramcats of the head word of the NP and the V, calls up all the rules that determine compatibility between heads and complements (or modifiers) within NPs.

There are at least three types of such conditions: grammatical, or local, agreement (as in SU-V agreement); filler-gap matching (as in the matching of properties between XP and XP[NULL] in WHQ); and antecedent-anaphor agreement (as in the matching between VP and VP[NULL] in VP ellipses: *I don't have to eat the sashimi, but you must* VP[NULL]). Again, it is a pressing task for theoretical syntax to map the world of conditions: the locations of the matching expressions, both with respect to one another and to other material; the properties that expressions must have to be eligible for matching; and the properties that have to match. There is a wealth of theory-specific treatments of these topics, of course - the 'binding theory' of GB, the Control Agreement Principle of GPSG, Jacobson's (1984) phrase-structure treatment of 'connectivity' in filler-gap pairings, Barlow's (1988) attempt to unify local agreement and anaphoric agreement in a single framework, to cite just a few important discussions - but no useful pretheoretical characterization of the terrain.

5.3. Explicit invocation. It could be argued that the invocations in the previous sections are entirely implicit in a correct statement of the rules involved. But there are others that appear to require explicit statement as separate conditions on constructions. These come in several varieties, the first echoing a type of morphological invocation, the others representing types of phenomena that are either rare or genuinely unparalleled in morphology.

5.3.1. Calls on construction sets. Parallel to the morphological rules in section 1.2.2, there are syntactic constructions that involve generalizations across sets of other constructions.

The English passive rule (call it #81), for instance, licenses a class of VPs (*seen through a telescope, given two awards, slept in*) by explicit reference to the full set of VPs involving objects of certain types. In checking that a VP is licensed by rule #81 we need to check that it satisfies the conditions in some other rule licensing VPs, except that it is missing some top-level object (DO, IO, or PO, respectively, in the examples above).

In the same vein, modifiers of Xs are, in general, licensed by rules as optional constituents of constructs of category XP, that is, by reference to all the rules that describe XPs. ADV modifiers of Vs (like *today* or *quickly*), for instance, are licensed by a rule that makes explicit reference to the full set of VPs. In checking that a VP (like *attract penguins today* or *bang the drum quickly*) is licensed by this rule we need to check that it satisfies the conditions in some other rule licensing VPs, except that it has an additional ADV (so that as a secondary goal we must verify the VP-hood of *attract penguins* and *bang the drum*, respectively).

And the primary rule that defines a VP constituent (in those languages that have one) involves a generalization across the rules expressing compatibility requirements on V heads with various sets of arguments, in that the rule says that a VP is composed of a V head and all of its non-SU arguments. In checking that a VP (like *are penguins on my porch* and *was given two awards*) is licensed by this rule we need to check that its head V and arguments satisfy the conditions in some compatibility rule for Vs (so that as a secondary goal for *are penguins on my porch* we must verify that BE is licensed as compatible with some class of SUs and two other arguments that can be instantiated as *penguins* and *on the porch*, and as a secondary goal for *was given two awards* we must verify that BE is licensed as compatible with some class of SUs and a passive - that is, #81-type - VP *given two awards*).

Note first that I am assuming (as in Zwicky (1989a) a partial separation of rules describing the compatibility between heads and their syntactic arguments (or their modifiers), on the one hand, from those describing the packaging of material into constituents - a distinction reminiscent of LFG's separation between f-structure and c-structure, but viewed here as a distinction between types of rules rather than types of representations.

And note that the constructions calling on construction sets include the bulk of those for which GPSG has been inclined to posit metarules, but quite a different proposal is being

made in the GPSG framework - where metarules predict the existence of one set of rules on the basis of the existence of another set - from the view I am suggesting here, where (given a finite set of syntactic rules in any (variety of a) language) the applicability of one rule to an expression entails the applicability of other rules to that expression.

5.3.2. Calls on specific constructions. Many syntactic constructions invoke other specific constructions, which can be picked out by ad hoc names like 'FOCNEG' (for the English focused negation construction) or by equally arbitrary indices like #81 (for the English passive VP construction).

Examples have already appeared in other contexts. As I pointed out in section 3, for instance, English YNQ calls for SAI (rather than getting the default SVP), while WHQ and FOCNEG call for both SAI and FOCINIT.

English has a number of compatibility rules permitting a V head, a SU, and a VP complement. Some of these place rather modest requirements on the VP. For instance, there is such a rule asking only that the VP have a head V in its BSE form, as in *Lynn must be successful*; its V subcategory comprises the modal Vs, like MUST. Others are more demanding, right up to the point of wanting a specific VP construction. One such compatibility rule calls for a passive VP, that is, for a VP satisfying the conditions of rule #81, as in *Chris was given two awards*; its V subcategory comprises only BE and GET. Another calls for a perfect VP, as in *Pat has traveled to Spain*; its V subcategory comprises only HAVE.

5.3.3. Secondary stipulation. It is also possible for a rule to stipulate conditions at two layers, explicitly invoking one or more secondary conditions as well as its primary conditions.

5.3.3.1. Secondary stipulation of grels. Many constructions - essentially, those corresponding to the 'relation changing' rules of TG - involve two layers of stipulated conditions on the grels holding among their parts.

For example, the English subject-to-object raising (SOR) construction (as in *I believed it to be raining* and *I believed there to be problems with your theory*) involves primary conditions requiring a V, its SU, its DO, and an infinitival VP complement to it - plus the secondary stipulation that the DO expression must satisfy the conditions appropriate for a SU of the VP complement. As these very examples illustrate, weather IT and expletive THERE can occur as the DO in SOR (though not as the DO in most other constructions); their acceptability depends on their having the properties of a SU of the VP complement: **I believed there to have rained*, **I believed it to have been problems with your theory.*

Indeed, SVP itself involves a secondary stipulation, since it licenses the combination of a SU with a VP having a compatible head and arguments.

I assume that, in the default situation at any rate, these invoked conditions can be predicted from the semantics, in particular the semantic functor-argument organization, of the construction, in a fashion similar to the default syntax-semantics associations sketched in section 4. This is my interpretation of the various 'semantic theories of control', as in Dowty (1985). But it seems to me that the invoked conditions must nevertheless be stated in the syntax, since what is required is syntactic as well as semantic congruence, as is evidenced by the differential behaviors of dummy IT and THERE just illustrated.

5.3.3.2. Secondary stipulation of categories. Constructions can also involve two levels of stipulated conditions on the categories making them up.

SAI in English, for instance, combines a SU and not just any compatible VP, but only a VP with head V and complement VP (and then, of course, not all of these, but only such a VP with a head V belonging to a particular subcategory, namely AUX). It is a characteristic

of 'liberation' analyses of constituent combinations (Zwicky 1986a) that they involve secondary stipulation of this sort.

5.4. Invocations by idioms. Individual idioms invoke specific constructions, in two rather different ways - with respect to their internal composition and with respect to external distribution.

First, idioms are 'parasitic on' syntactic constructions, in the sense that each idiomatic expression instantiates one or more constructions in its language. The English idiom BE TO 'visit', as in *I've been to Vienna* instantiates a construction with a copular head V and a spatial adverbial complement, as in *I've been in Vienna.* And dubitative COME ON and GO ON, as in *Aw, come on!* and *Go on! I don't believe it!*, instantiate the V+P construction in *The light just went on* and *The gun went off.*

Second, idioms are subject to conditions restricting them to occurrence in particular syntactic constructions, even though their internal composition would not predict such restrictions. BE TO 'visit' is limited to the perfect construction in my variety of English: **I'll be to Vienna this summer*, **I was to Vienna last summer.* And dubitative COME ON and GO ON are limited to the imperative: **He came on* 'He expressed doubts about some matter'. One-word idioms - which is to say, individual lexemes - are well-known to be subject to such conditions, as when the SOR verbs RUMOR and REPORT are limited to the passive: *They were rumored to be spies*, **People rumored them to be spies.*

5.5. Layers of invocations. It should be obvious that invocations in syntax pile up in layers, just like invocations in morphology (section 2.4) and defaults in syntax (section 3.5). A sentence like *Must I be kissed?* instantiates SAI at layer 1, which means that at layer 2 *I* must satisfy a SU condition and *must be kissed* a VP condition, which means that at layer 3 the head V MUST has to be compatible with *I* as its SU and *be kissed* as its infinitival complement, which means that at layer 4 the head V BE must to compatible with *I* as its SU and a *kissed* as its passive VP complement, which means that at layer 5, *kissed* must instantiate a VP that has a PSP head V and is missing an object, which means that at layer 6 there must be a rule licensing a VP with head V KISS and a DO.

6. The big picture. It is all very well to allude to defaults, of several different kinds, coming in layers, and to invocations, also of several different kinds, also coming in layers. But what is the scheme by which a full set of rules, standing in various relations of overriding and invocation, interact with one another?

It is known that a program of this complexity can give rise to a number of nasty technical difficulties.[5] An explicit logic of override/default relationships between rules is needed, and an explicit logic of invocand/invocatum relationships as well. Still, it is possible to discern a general interactional scheme that is implicit in my remarks in this paper. Each rule has both a syntactic side and a semantic side, and I will treat them separately.

On the syntactic side, the ideal scheme is for all conditions, at whatever layer of invocation, to be obligatorily satisfied; that is, they must unify with one another. Default rules apply insofar as their conditions do not conflict with properties required by primary or invoked conditions. Remaining properties are free to vary.

Consider the way SOR works in Icelandic (Andrews 1982). As in English, the rule requires no specific case on the DO; the default associate of the DO grel, namely ACC case, is then what will normally appear. Also as in English, the rule explicitly invokes a condition that the DO must be licensed as a SU of the infinitival VP, so that all the rules placing conditions on SUs and their head Vs are thereby invoked. Most of these compatibility rules mentioning SUs require no specific case on the SU, so that the default NOM case for the SU grel appears, but there are special rules (involving specific subcategories of Vs) requiring other

cases, for instance the DAT. When the lower V in the SOR construction is one of the DAT-SU Vs, the DO will then have to appear in the DAT.

On the semantic side, the ideal scheme is for semantic conditions placed at the primary layer of the syntactic wellformedness check to be obligatorily satisfied, and for semantic conditions placed at any later stage in the syntactic wellformedness check (whether this involves invocation, defaulting, or free instantiation) to be satisfied so long as these do not conflict with conditions at any earlier stage.

Thus, the semantics of an idiom overrides the semantics of its contributory constructions, insofar as there is a conflict, and an invocand can treat some invocatum as a pure formal characteristic, as when the English imperative construction is invoked in the primary construction of *Kiss a pig and have your life changed*, with the declarative conditional semantics of the invocand overriding the imperative semantics of the invocatum. And, as in sections 4.2.1 and 4.2.2, default semantics for (sub)categories (like N and MASS) and for gramcats (like PL and PSP) appears so long as this does not conflict with constructional semantics.

Notes

* This is a preliminary version (of 26 November 1988) of a paper presented at the 1989 annual meeting of the Berkeley Linguistics Society. Earlier versions were presented at the University of Illinois, Urbana, on 10 November 1988 and at Indiana University, Bloomington, on 11 November 1988. My thanks to members of these audiences - especially Clay Bond, Georgia Green, Erhard Hinrichs, Jerry Morgan, and Robert Port - for their comments and questions.

1. The terms originate with Kiparsky (1968); see Schane & Bendixen (1978: 82) for a reasonably careful exposition.

2. I make no absolute claims here about how many layers of invocation there are and what conditions are imposed in each layer.

3. All references to 'case' hereafter are to morphological cases, not to any more abstract notion.

4. It is admittedly oxymoronic to call these phenomena quirky agreement, given that they present themselves as disagreements in gramcats. Quirky agreement is one of two routes by which gramcat mismatches (see Barlow (1988: sec. 3.4) for a compact compendium of examples) can arise when matching would be expected, the other being failure of an agreement rule to apply.

5. See Gazdar (1987) for some discussion of the problems default schemes alone can generate. Some of these evaporate when grels are integrated within the descriptive framework, and others when defaults are consistently viewed as relations between rules rather than between properties. No doubt there is plenty of trouble left.

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